

What is claimed is:

1. An optoelectronic component, comprising:
  - a semiconductor substrate;
  - an active layer overlying the semiconductor substrate;
  - a further active layer overlying the semiconductor substrate;
  - an absorber device associated with the further active layer;
  - an amplifier device associated with the active layer,wherein the absorber device and the amplifier device reside within an optical resonator portion of the component.

2. The optoelectronic component of claim 1, wherein the optical resonator portion comprises a resonator wall defined by a silvered edge of the component.

3. The optoelectronic component of claim 2, wherein the absorber device borders directly against the silvered edge of the component.

4. The optoelectronic component of claim 1, wherein at least one of the active layer and the further active layer comprises quantum dot (QD) or a multiple quantum dot (MQD) layer.

5. The optoelectronic component of claim 1, wherein the active layer associated with the amplifier device comprises a QD layer or an MQD layer.

6. The optoelectronic component of claim 2, the component further comprising a light emission surface opposing the silvered edge, wherein the light emission

surface comprises a reflecting layer having a reflection that is less than a reflection of the silvered edge.

7. The optoelectronic component of claim 1, further comprising a further amplifier device arranged next to the amplifier device on a side facing away from the absorber device.

8. The optoelectronic component of claim 7, further comprising a Bragg grating isolating device arranged between the amplifier device and the further amplifier device.

9. The optoelectronic component of claim 8, wherein the Bragg grating isolating device extends into the active layer and the further active layer.

10. The optoelectronic component of claim 6, wherein the amplifier device and absorber device together comprise a pulse generating device, further comprising at least one auxiliary pulse generating device comprising an auxiliary amplifier device and an auxiliary absorber device disposed between the pulse generating device and the light emission surface.

11. The optoelectronic component of claim 10, further comprising at least one isolating element disposed between the pulse generating device and the at least one auxiliary pulse generating device, respectively.

12. The optoelectronic component of claim 11, further comprising a cover layer overlying the further active layer, wherein the at least one isolating element comprises a recess, a trench formed by ion

implantation or by a grating structure extending down vertically into the cover layer.

13. The optoelectronic component of claim 1, further comprising an electrical connector pad for the absorber device overlying a top portion of the component, wherein the electrical connector pad is tapered.

14. The optoelectronic component of claim 13, wherein a blocking voltage is applied to the electrical connector pad of the absorber device.

15. A method for generating light pulses in the optoelectrical component of claim 1, comprising:

applying a blocking voltage to the absorber device; and

modulating the applied blocking voltage.

16. The method of claim 15, wherein modulating the applied blocking voltage comprises modulating a frequency of the blocking voltage such that a pulse repetition rate of the generated light pulses is an integer multiple of the modulation frequency.

17. The method of claim 16, wherein the integer multiple is less than 100.

18. The method of claim 17, wherein the integer multiple is less than 11.

19. An optoelectronic component, comprising:  
a semiconductor substrate;  
an active layer overlying the semiconductor substrate;  
a further active layer overlying the semiconductor substrate;

an absorber device associated with the further active layer;

an amplifier device associated with the active layer,

wherein the absorber device and the amplifier device reside within an optical resonator portion of the component, and

wherein a band gap of the active layer is optimized for operation of the amplifier device, and a band gap of the further active layer is optimized for operation of the absorber device.

20. The optoelectronic component of claim 19, wherein the band gaps of the active layer and the further active layer are selected to establish a dependency of a gain on a carrier density of the amplifier device to be substantially smaller than a dependency of an absorption on a carrier density of the absorber device.

21. The optoelectronic component of claim 19, wherein a band gap of the active layer and a band gap of the further active layer fulfill the conditions:

$E_t \text{ (further active layer)} = h\nu$ , and

$E_t \text{ (active layer)} - E_t \text{ (further active layer)} \leq 30 \text{ meV}$ ,

wherein  $E_t$  is the band gap,  $h$  is Planck's constant,  $\nu$  is an optical frequency of the generated light pulses.